

Abstract:

Background:

The University of Colorado Mobile Stroke Unit (MSU) provides ambulance-mounted CT scanning and tele-stroke neurologic assessment in the Aurora, CO, metropolitan area. As one of the first U.S. medical centers to utilize a mobile stroke protocol we sought to compare operational characteristics of the MSU during its first year with standard management (SM) of prehospital stroke alerts at a Comprehensive Stroke Center.

Methods:

The study compared patient and stroke characteristics, ambulance response, neurologic evaluation, and treatment between the MSU, and SM patients for the same ambulance service area. Variables included time from stroke alert (MSU or ambulance dispatch) to tPA administration, as well as time from arrival at the door of MSU or ED to first brain CT and to IV tPA administration. Patients were dichotomized into those with time from door to needle greater and less than the American Stroke Association "Target" study goal of 45 minutes.

Results:

Between Jan. 15, 2016 and Jan. 9, 2017, 47 patients received prehospital management with the UC MSU, and 73 received standard management. Median age was 66 years (IQR 57-77), and 45% were female, with no difference between MSU and SM patients. Thirteen (28%) of patients were treated with IV tPA on the MSU, compared with 16 (22%) through SM. Median time was significantly shorter from door to first CT on the MSU than SM [4 minutes (IQR 4-5) MSU vs. 9 minutes (IQR 6-15) SM,  $p < 0.001$ ].

Median time from dispatch to IV tPA administration was shorter on the MSU [39 minutes (IQR 35-45) MSU vs. 65 minutes (IQR 49-96) SM,  $p < 0.001$ ], and for door to IV tPA [26 minutes (IQR 20-29) MSU vs. 37 minutes (IQR 24-65) SM,  $p = 0.022$ ]. MSU patients were more likely to have door-to-needle times meeting the ASA goal of <45 minutes [13 (100%) MSU vs. 11 (69%) SM,  $p = 0.048$ ].

#### Conclusions:

Patients treated via the MSU benefited from quicker time to CT, neurologic evaluation, and, critically, significantly shorter time from dispatch to tPA administration, compared with pre-hospital stroke alerts arriving from the same service area. These results suggest prehospital management with an MSU has potential to aid the goal of earlier thrombolysis after ischemic stroke symptom onset.